What is claimed is:

1. A turbo-molecular pump comprising:

a rotor;

a stator assembly surrounding said rotor; and

a casing portion surrounding said stator assembly,

wherein at least a partial clearance is formed between said stator assembly and said casing portion, so that, when an abnormal torque is applied from said rotor to said stator assembly, direct impact transmission is prevented from said stator assembly to said casing portion.

2. A turbo-molecular pump according to claim 1, further comprising a reinforcing member for reinforcing said stator assembly.

3. A turbo-molecular pump according to claim 2, wherein said reinforcing member is a cylindrical member arranged between said stator assembly and said casing portion.

4. A turbo-molecular pump according to claim 2, wherein said reinforcing member combining elements constituting said stator assembly.

5. A turbo-molecular pump according to claim 4, wherein said stator assembly comprises a stacked configuration for fixing said stator vanes in a vane pumping section.

6. A turbo-molecular pump according to claim 5, wherein said reinforcing member is axially aligned to penetrate said stacked configuration.

7. A turbo-molecular pump according to claim 1, wherein said stator assembly includes a groove pumping section spacer.

8. A turbo-molecular pump according to any of claims 2 to 5, wherein said reinforcing member is made of a material capable of absorbing impact generated by abnormal torque.

9. A turbo-molecular pump according to any of claims 1 to 6, wherein said reinforcing member comprises a hollow pipe.

10. A turbo-molecular pump according to any of claims 1 to 9, further comprising a slide facilitating member for facilitating said stator assembly to slide in a circumferential direction relative to said casing portion.

11. A turbo-molecular pump according to claim 10, wherein said slide facilitating member is a low friction member provided between said stator assembly and said casing portion.

12. A turbo-molecular pump according to claim 10, wherein said slide facilitating member is a support structure for rotatably supporting said stator assembly.

13. A turbo-molecular pump according to claim 1, wherein an impact absorbing member is provided between said stator assembly and said casing portion.

14. A turbo-molecular pump according to claim 1, wherein said stator assembly has a multiple structure comprising stator vanes.

15. A turbo-molecular pump according to claim 1, further comprising a temperature adjusting mechanism for directly or indirectly heating or cooling said stator assembly.

16. A turbo-molecular pump comprising:

a casing portion housing a stator and a rotor therein; and

a vane pumping section and/or a groove pumping section comprised by said stator and said rotor,

wherein an impact absorbing structure is provided in at least a part of said stator, said impact absorbing structure being arranged to cooperatively work with or interlocking move said rotor to absorb impact loaded on said stator when abnormal torque is applied from said rotor to said stator.

17. A turbo-molecular pump according to claim 16, wherein said impact absorbing structure comprises an inner casing surrounding said vane pumping section and/or a groove pumping section.

18. A turbo-molecular pump according to claim 17, wherein a clearance is provided between said inner casing and said casing portion.

19. A turbo-molecular pump according to claim 17, wherein said inner casing is fixed by fitting a part of an inner surface or an outer surface of said inner casing to a cylindrical portion of said stator or to said casing portion.

20. A turbo-molecular pump according to any of claims 17 to 19, wherein said impact absorbing structure comprises a friction reducing mechanism provided between said inner casing and said stator or said casing portion.

21. A turbo-molecular pump according to any of claims 17 to 20, wherein said impact absorbing structure comprises an impact absorbing member provided between said stator in said vane pumping section and/or groove pumping section and said inner casing.

22. A turbo-molecular pump according to claim 17, wherein said inner casing and/or said casing portion is comprised by a high thermal conductivity material.

23. A turbo-molecular pump according to claim 16, wherein said vane pumping section comprises a vane pumping section stator assembly of a stacked configuration for fixing said stator vanes, and said impact absorbing structure comprises

a bar member axially penetrating said vane pumping section and capable of absorbing an impact generated by abnormal torque.

24. A turbo-molecular pump according to claim 23, wherein said reinforcing member absorbs impact through its self deformation.

25. A turbo-molecular pump according to claim 24, wherein said deformation is performed through elastic or plastic deformation.

26. A turbo-molecular pump according to claim 25, wherein said deformation is accompanied by fracturing.

27. A turbo-molecular pump according to claim 23, wherein said vane pumping section comprises a multiple structure.

28. A turbo-molecular pump according to claim 27, wherein said multiple structure is formed corresponding to said stator vanes having a different diameters along the axial direction.

29. A turbo-molecular pump according to claim 23, wherein said bar member comprises a hollow pipe.

30. A turbo-molecular pump according to claim 16, wherein said vane pumping section stator assembly is attached

to said casing portion by way of a friction reducing mechanism.

31. A turbo-molecular pump according to claim 16, further comprising a temperature adjusting mechanism for directly or indirectly heating or cooling said stator portion in said vane pumping section and/or said groove pumping section.

32. A turbo-molecular pump according to claim 31, wherein said impact absorbing structure comprises an inner casing surrounding said vane pumping section and/or said groove pumping section, said temperature adjusting mechanism being provided on said inner casing.